

We claim:

1. A tubular bat for hitting a ball, the bat comprising:
 - a) a core shaft having a core shaft length, including a handle portion for gripping the bat;
 - b) a barrel having a proximal portion and a distal portion, the barrel for being connected to the core shaft;
 - c) a first connecting structure for connecting the proximal portion of the barrel to the core shaft;
 - d) a second connecting structure for connecting the distal portion of the barrel to the core shaft;
 - e) a separation disposed between the core shaft and the barrel;

wherein

- i) the barrel is for hitting the ball; and
- ii) the separation is for allowing the barrel to elastically deform when the barrel hits the ball.

2. A bat as claimed in claim 1, wherein

- a) the barrel further has a barrel length and a distal barrel end; and
- b) the core shaft length extends along the barrel length substantially to the distal barrel end.

3. A bat as claimed in claim 1, wherein the first connecting structure and the second connecting structure respectively are flexible structures.

4. A bat as claimed in claim 1, wherein the first and second connecting structures each comprises a shape selected from being circular, conical, pleated and toroidal.

5. A bat as claimed in claim 1, wherein

- a) the barrel further has a proximal folded portion and a distal folded portion;
- b) the first connecting structure includes the proximal folded portion; and
- c) the second connecting structure includes the distal folded portion.

6. A bat as claimed in claim 1, wherein the core shaft cross-section comprises a

substantially circular cross-section of substantially constant diameter along the core shaft length.

7. A bat as claimed in claim 1, wherein the handle portion cross-section comprises a substantially ovoid cross-section.
8. A bat as claimed in claim 1, wherein the handle portion cross-section comprises a substantially elliptical cross-section.
9. A bat as claimed in claim 1, wherein the handle portion cross-section comprises a substantially triangular shape.
10. A bat as claimed in claim 1, wherein the core shaft further includes a proximal shaft end beginning the handle portion, the handle portion being disposed between the proximal shaft end and the proximal end of the barrel, the bat further comprising a tapered section disposed between the handle portion and the proximal end of the barrel.
11. A bat as claimed in claim 10 comprised of separate barrel, taper, and shaft components.
12. A bat as claimed in claim 10, wherein the tapered section is an integral part of the barrel.
13. A bat as claim 10, wherein the tapered section has a circular cross-section.
14. A bat as claimed in claim 10 wherein the tapered section has a non-circular cross-section.
15. A bat as claimed in claim 14, wherein the tapered section non-circular cross-section is star shaped.
16. A bat as claimed in claim 1, wherein the second connecting structure serves as an end cap.
17. A bat as claimed in claim 1 wherein the barrel has a distal barrel end, further comprising an end cap disposed at the distal barrel end.
18. A bat as claimed in claim 1 wherein the bat further comprises a resilient means disposed between the barrel and the core shaft, the resilient means for attenuating vibrations and for allowing the barrel to elastically deform when the barrel hits a ball.
19. A bat for hitting a ball, the bat comprising:
 - a) a core shaft including a shaft length and a cross-section,
 - b) a barrel for being connected to the shaft, the barrel including a portion that provides maximum bat performance, and

c) a connecting means for connecting the barrel to the shaft, said connecting means having a resilient stiffness,

wherein the barrel portion having the maximum bat performance is in dependence on the stiffness of the connecting means.

20. A bat as claimed in claim 19 wherein the resilient means is selected from the group consisting of foam, springs, rings, toroids and air bags.

21. A tubular bat for hitting a ball, the bat having a length and a ball striking surface and further comprising:

- a) a shaft including a handle portion for gripping the bat, the shaft extending for substantially the full length of the bat;
- b) a batting portion extending along a portion of the shaft beyond the handle portion, and
- c) resilient means deployed along the batting portion of the bat to provide said ball striking surface.

22. A bat as claimed in claim 21 wherein the resilient means comprises multiple, individual, resilient means which are each toroidal in shape.